Manitoba
Agriculture

Report No. 12

MANITOBA REGIONAL Sunflower PERFORMANCE TESTS • 1991

A Report on Tests of Commercial Hybrids
Sponsored by The Manitoba Sunflower Committee

MG-11787 (REV. 90)

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MANITOBA REGIONAL

SUNFLOWER PERFORMANCE TESTS

1991

Sponsored by the

MANITOBA SUNFLOWER COMMITTTEE

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INTRODUCTION

The Manitoba Sunflower Committee was organized under authority of the Minister of Agriculture for Manitoba to provide a vehicle for testing sunflower cultivars in Manitoba.

The Committee has now conducted performance trials for 12 consecutive years. The performance data generated through the trials has been used in support of registered sunflower hybrids in Canada. Generally, a minimum of 2 years performance data is required in order to determine the acceptability of a hybrid for registration. In addition, the performance data provides helpful information to sunflower growers in selecting hybrids for their farm production.

The 1991 growing season commenced with sufficient topsoil moisture for crop establishment and early crop growth. Heavy rains in late May followed by further favourable rains in June restored moisture reserves. Sunflower crops progressed favourably throughout the growing season, and above average yields were attained in 1991.

The Sunflower Committee annually conducts a fall tour which provides an opportunity to observe the performance of hybrids at various sites in the province.

We hope the services performed by the Committee will continue to be helpful to sunflower breeders and producers.

J. R. Rogalsky, Chairman
Manitoba Sunflower Committee

1992 Sunflower Recommended List

Hybrid	Company	Yield[1] as % of Checks	Years Tested	Days to Maturity	% Oil (10% Moist)	Height cm (in)	Reaction to Rust[2]	Verticillium Wilt[3]	Downey Mildew[3]	Sclerotinia Wilt[7]
OIL TYPE SUNFLOWERS										
207	Cargill	103	5	116	40.0	167 (66)	MS	R	S	HS
SF 187	Cargill	106	5	117	42.2	136 (54)	MS	R	HS	MS
DO 707	Dahlgren	103	5	116	43.8	146 (57)	MS	MR	MS	MS
DO 827	Dahlgren	101	4	114	43.6	146 (57)	MS	MR	R	MS
DO 855	Dahlgren	93	5	113	43.6	151 (59)	MR	MR	R	S
DO 837	Dahlgren	92	5	108	42.6	163 (64)	MS	MS	MS	HS
Hysun 340	Garst	99	4	117	43.6	149 (59)	MS	MR	HS	S
IS 7000	Interstate	90	5	111	45.0	149 (59)	MS	MR	S	S
7101	Interstate	93	5	113	43.2	156 (61)	MS	MR	MR	S
IS 7111	Interstate	94	5	113	45.5	149 (59)	MR	MR	MS	MS
MRS 40	Interstate	93	5	109	43.6	135 (53)	MR	R	MS	MR
Cadet	Jacques	97	5	110	44.6	141 (56)	MS	R	MS	MS
Capri	Jacques	98	5	115	45.5	138 (54)	MR	R	MS	MR
Challenger	Jacques	99	5	114	44.5	146 (57)	MS	R	MS	MR
S1296	NK	100	5	113	43.9	148 (58)	MS	MR	MS	MS
Sunbred 265	NK	94	3	117	43.4	145 (57)	MR	R	MR	-
6322	Pioneer	100	5	112	46.5	150 (59)	MS	MR	MR	S
6440	Pioneer	97	5	117	44.6	159 (63)	MS	MR	MR	S
Dak.Gold II	Agripro	92	5	112	47.0	145 (57)	MS	MR	S	MS
ST 310	Agripro	94	4	115	44.7	134 (53)	MS	R	R	MS
ST 330	Agripro	98	5	117	42.6	153 (60)	MR	R	MS	R
422	SigCo	92	5	110	42.0	144 (57)	MS	MR	MR	MR
452	SigCo	99	5	116	45.4	146 (57)	MS	R	R	MS
465A	SigCo	99	5	117	42.9	150 (59)	MS	R	R	MS
High Oleic Sunflowers[4]										
Isoleic	Interstate	88	4	120	43.3	155 (61)	MS	MR	MR	MS
Trisun 849	SigCo	87	5	116	43.1	157 (62)	MS	MR	MS	S
Dwarf Sunflowers[5]										
Sunwheat 101	Agripro	80	5	108	39.3	96 (38)	MS	MR	MS	MS
NON-OIL TYPE SUNFLOWERS					Seed Size % over 20/64					
R.H. 2141	Agway	97	5	115	12	164 (65)	S	MS	MS	MS
IS 8004	Interstate	98	3	117	29	169 (67)	S	S	HS	-
D131	Dahlgren	102	5	117	18	155 (61)	MS	MS	S	S
D151*	Dahlgren	98	3	117	31	148 (58)	S	MR	MS	S
954	SigCo	94	5	116	41	160 (63)	S	MS	MS	HS
964	SigCo	96	5	111	21	150 (59)	S	MS	S	S
974	SigCo	97	5	118	53	167 (66)	S	MR	S	S

* On recommended list for the first time.

[1] Mean of hybrids SF 187, IS 7111, S 1296: 1987-91 all Manitoba trials, 2836 kg/ha (2532 lb/ac)

[2] Resistance indicated is the mean of natural infestation in all coop sites (see comments).

[3] Resistance indicated is to Race 2. Hybrids are susceptible to Races 3 and 4, currently established in Manitoba (see comments).

[4] These hybrids have high oleic acid content and are grown under contract only.

[5] Dwarf sunflowers require specific managment practices (see comments).

[6] Reaction to disease: R=Resistant; MR=Moderately resistant; MS=Moderately susceptible; S=Susceptible; HS=Highly susceptible.

[7] Reaction to sclerotinia wilt (stem rot) is based on 3 years of testing (1988-90) in naturally infected fields.

Table 1. Manitoba Oilseed Sunflower Committee Trials - 1991 Means
(5 locations - Altona, Morden, Killarney, Holland, Neepawa)

Hybrid	Yield kg/ha	Oil %	Days to 80% Bloom	Days to Mature	Height (cm)	Lodging %	Density (kg/m^3)	Wt/1000 seeds (g)	Meal Protein %
DO 827	3375	46.1	66	109	166	4	421	50.3	46.5
DO 707	3333	46.3	67	111	168	1	394	49.9	46.2
IS 6111	3332	45.5	65.5	108	159	1	412	54.3	47.7
C 207	3244	43.1	70	110.5	184	2	412	55.4	48.0
Capri	3235	48.4	66.5	110	151	0	412	53.4	45.3
SF 187	3228	44.3	71	112	163	1	390	47.9	47.1
8812	3214	47.3	67	110	157	7	400	49.6	46.3
DEK 3785	3183	48.5	67.5	109.5	156	0	419	43.2	44.3
9W1547	3173	49.0	65	104.5	158	8	418	51.8	46.5
Sig 465A	3149	44.8	68.5	112.5	170	3	404	48.1	47.6
X16270	3155	46.7	67.5	110	160	0	409	51.8	49.3
DEK 3790	3148	48.2	68.5	112.5	161	0	436	45.1	46.2
DEK 3840	3148	46.1	71	113.5	171	1	401	45.9	46.6
S1296	3144	46.0	66.5	108.5	168	7	409	52.0	50.3
DEK 3861	3140	47.1	73	115	175	18	398	49.3	45.5
DEK 399	3118	46.1	67.5	109	165	0	393	49.7	47.4
DEK 3800	3112	46.8	70.5	109.5	170	15	382	49.5	45.2
Cadet	3096	46.5	66	108	163	1	404	49.3	46.5
PX 391	3090	47.9	67.5	106.5	161	7	419	54.4	47.8
Sig 452	3090	46.9	68	111	166	9	410	47.6	45.6
P8V0073	3078	48.2	69.5	109.5	172	28	396	52.9	46.5
DEK 3946	3076	46.2	67.5	110.5	157	0	401	51.3	46.5
MRS 55	3070	46.5	71.5	113.5	161	3	370	59.6	46.0
Challenger	3064	46.5	67.5	110	163	1	395	48.3	46.2
Hysun 340	3063	45.4	70	113	171	4	352	49.3	46.2
Sig 846	3055	44.3	69.5	111.5	163	7	386	50.4	46.4
65122	3048	47.6	67	107	167	0	393	49.5	46.8
P6322	3045	48.8	69	108	167	1	405	50.0	44.9
PAC 7622	3040	43.0	68.5	109.5	163	6	416	50.0	48.6
Sunbred 268	3020	45.7	70	110	185	6	379	59.5	46.6
ST 330	3010	45.3	68.5	112.5	169	1	418	47.5	47.2
Gar 7752	3006	44.7	70	113	157	4	412	46.6	47.2
Gar 1000	2985	46.5	71	111	174	2	395	51.1	51.4
MRS 40	2982	45.6	64	106.5	153	4	408	47.0	46.8
Sunbred 265	2982	46.6	69	112.5	161	12	404	53.6	48.0
MRS 51	2980	41.8	63.5	103.5	162	0	432	66.3	49.8
Sig 422	2977	45.2	63.5	105.5	163	0	428	55.6	48.0
P6440	2976	46.7	72.5	112	181	0	386	48.5	48.2
DO 837	2969	46.1	64.5	105	181	1	410	60.3	46.4
880165	2963	49.1	71	112.5	173	1	392	43.2	43.5
ST 310	2949	47.2	70	111	154	1	415	42.2	45.6
S1888	2917	45.4	70	110.5	176	4	407	41.7	44.2
DO 855	2914	47.0	68	110.5	167	3	401	50.1	45.5
IS 7111	2887	48.1	68	109	165	1	388	51.1	48.0
IS 7101	2877	45.5	69	109.5	181	3	396	45.7	47.5
IS 7000	2871	47.8	65.5	106.5	172	0	387	54.8	47.7
Sig 458	2869	51.3	70	111	159	1	434	48.4	46.9
Dak Gold 2	2823	49.5	69	109.5	163	0	399	48.5	46.9
MRS 53	2818	43.8	68.5	107.5	154	7	361	54.7	46.8
EX 1990	2802	49.5	68.5	110.5	161	0	394	47.7	45.1
MRS 52	2753	50.3	68	108	167	3	369	49.7	44.8
Isoleic	2711	45.8	73	115	175	1	393	53.1	47.3
P6425HO	2694	46.7	72	113.5	181	3	400	44.0	45.6
MRS 50	2664	44.4	68	103	169	17	347	50.4	47.5
ST 439	2655	44.6	71.5	112	181	2	404	42.0	47.1
MRS 54	2637	47.5	70	109	156	2	398	51.0	47.4
Trisun 849	2620	44.9	70	112.5	171	2	396	45.8	46.2
Sunwheat 101	2565	41.9	65	105.5	112	0	386	50.6	48.7
Sunwheat 103	2461	44.0	56.5	101.5	111	0	386	67.7	51.0

Table 2. Performance data from Altona Oilseed Sunflower Trial, 1991

Hybrid	Yield kg/ha	Oil %	Days to 80% bloom	Days to Maturity	Lodging %	Density kg/m³	Wt/1000 seeds, g
Hysun 340	3184	46.0	70	112	0	363	47.0
P6322	3082	48.1	69	107	0	423	49.1
P6440	3254	47.5	73	111	0	403	50.3
C207	3357	42.7	71	110	2	416	55.6
SF 187	3449	45.2	72	112	0	400	43.8
Sig 422	3129	45.4	64	105	0	453	51.5
Sig 465A	3243	45.5	69	111	0	421	43.8
Sig 452	3171	47.0	68	111	1	425	46.9
Trisun 849	2686	45.4	70	110	0	419	44.8
Sunwheat 101	2745	42.5	66	104	0	405	48.7
Sunwheat 103	2512	45.2	57	102	0	413	64.1
ST 330	3232	44.9	69	110	0	433	45.0
ST 310	3029	47.3	70	111	0	441	39.9
ST 880165	3219	49.0	71	111	0	410	39.4
Dakota Gold 2	3045	50.2	69	109	0	414	48.4
Dekalb 399	3047	46.3	68	107	0	411	49.0
Dekalb 3840	3385	46.7	71	112	0	426	44.9
Dekalb 3800	3262	47.0	71	109	2	404	46.1
Dekalb 3861	3502	48.1	73	114	0	418	49.8
Dekalb 3946	3325	47.0	68	109	0	432	51.7
Sunbred 268	2921	45.4	71	109	3	391	56.7
DO 707	3422	47.5	68	110	0	407	47.8
DO 855	3097	46.9	69	110	0	416	53.3
DO 827	3441	45.9	67	107	5	432	46.2
S1888	3110	45.4	70	109	0	439	41.1
S1296	3219	45.6	68	107	6	416	47.3
Sunbred 265	3174	46.9	69	111	0	422	49.2
Challenger	3149	46.0	68	108	0	413	44.2
Capri	3414	48.8	67	108	0	424	52.6
Cadet	3265	47.0	67	108	1	420	46.8
IS 7111	3017	48.9	69	108	1	416	48.4
IS 7000	2867	46.8	66	105	0	407	53.1
MRS 40	3143	46.0	65	106	3	430	46.0
IS 7101	2920	45.8	69	108	0	419	44.6
Isoleic	2837	45.5	73	114	1	416	51.6
IS 6111	3420	46.1	66	107	1	439	55.9
Sig 458	2991	50.8	71	109	0	445	45.4
PAC 7622	3322	43.2	69	109	3	433	49.0
Garst 7752	2892	43.6	70	111	1	424	45.0
Garstoil 1000	3123	47.1	72	110	0	412	51.9
MRS 50	2440	44.3	69	103	6	355	46.6
MRS 51	2775	41.0	64	103	0	455	64.5
MRS 52	2974	49.9	68	107	1	379	44.9
MRS 53	2997	44.0	69	107	6	377	54.0
DO 837	2833	45.5	65	105	0	436	60.7
MRS 55	2937	45.6	73	114	0	376	55.3
P6425HO	2848	47.0	73	113	0	423	45.1
PXF 391	3168	48.0	68	107	2	443	54.4
P9W1547	3354	49.1	66	105	6	438	52.0
P8V0073	3170	48.4	70	109	12	401	50.3
X16270	3224	46.6	68	108	0	433	51.6
Ex 1990	3059	49.4	69	110	0	413	45.7
Sig 846	3158	45.0	70	110	0	398	46.7
ST 439	2875	44.9	72	110	0	425	39.8
Dekalb 3785	3345	48.8	68	108	0	446	44.2
Dekalb 3790	3322	48.6	69	111	0	460	44.3
EX 8812	3165	46.6	68	109	0	407	46.1
IS 65122	3094	47.4	68	106	0	413	46.6
MRS 54	2614	47.2	71	109	0	419	47.3
C.V.%	6.0	1.1	1.1	1.2	324	1.7	5.4
LSD (.05)	274	1.1	1.1	1.9	5	10	3.8

Seeded May 14 on cereal stubble.

Table 3. Performance data from Morden Oilseed Sunflower Trial, 1991.

Hybrid	Yield kg/ha	Oil %	Days to 80% Bloom	Days to Maturity	Height cm	Lodging %	Density kg/m³	Wt/1000 seeds, g	Meal Prot. %	Self Comp. %
Hysun 340	3270	46.2	70	114	181	8	358	50.2	47.3	
P6322	3301	50.7	69	109	174	1	415	48.2	44.1	
P6440	3621	48.2	72	113	196	0	399	52.2	48.3	
C207	3794	45.0	69	111	195	1	424	58.1	48.0	
SF 187	3731	46.0	70	112	167	1	416	48.0	47.1	92
Sig 422	3268	47.4	63	106	168	0	451	55.3	47.6	
Sig 465A	3490	46.3	68	114	181	6	415	47.3	47.6	
Sig 452	3334	48.3	68	111	175	16	420	47.8	45.5	
Trisun 849	2898	47.1	70	115	175	4	412	46.6	46.6	
Sunwheat 101	2838	43.2	64	107	112	0	398	50.1	49.7	
Sunwheat 103	2302	45.1	56	99	116	0	379	57.8	49.9	
ST 330	3274	48.0	68	115	172	1	432	49.0	47.4	
ST 310	3214	49.5	70	111	155	1	427	41.6	47.1	
ST 880165	3194	51.4	71	114	174	1	404	43.0	42.0	
Dakota Gold 2	2993	51.8	69	110	167	0	419	48.8	45.2	
Dekalb 399	3371	48.9	67	111	173	0	406	48.0	43.6	
Dekalb 3840	3696	47.9	71	115	179	1	427	48.8	47.3	
Dekalb 3800	3437	48.4	70	110	180	27	388	50.6	45.4	
Dekalb 3861	3804	49.3	73	116	185	35	419	53.0	47.1	
Dekalb 3946	3349	48.4	67	112	162	0	397	53.4	47.3	
Sunbred 268	3429	46.5	69	111	185	8	394	66.3	47.0	
DO 707	3753	48.2	66	112	174	2	409	40.7	46.1	
DO 855	3114	48.7	67	111	172	5	404	53.8	45.6	
DO 827	3593	48.0	65	111	167	3	435	48.1	45.6	
S1888	3312	47.4	70	112	184	7	417	40.8	44.6	
S1296	3597	48.5	65	110	177	7	427	51.7	45.8	90
Sunbred 265	3300	48.9	69	114	169	23	422	53.8	48.1	
Challenger	3451	47.8	67	112	172	1	413	49.6	46.5	
Capri	3620	50.9	66	112	160	0	428	52.6	45.0	
Cadet	3637	48.4	65	108	169	0	420	49.8	47.1	
IS 7111	3258	49.9	67	110	169	1	413	54.4	49.5	60
IS 7000	3338	49.2	65	108	175	0	403	58.2	49.2	
MRS 40	3290	47.5	63	107	157	4	417	45.4	46.3	
IS 7101	3255	47.0	69	111	188	6	418	47.7	47.9	
Isoleic	3105	47.3	73	116	183	0	412	57.4	48.0	
IS 6111	3509	47.7	65	109	161	1	428	55.1	46.5	
Sig 458	3465	53.6	69	113	173	1	462	51.3	46.0	
PAC 7622	3266	43.7	68	110	172	9	427	51.1	50.1	91
Garst 7752	3428	46.9	70	115	162	6	428	48.6	46.9	74
Garstoil 1000	3396	48.3	70	112	176	4	412	53.5	48.0	92
MRS 50	3290	47.0	67	103	179	28	362	49.4	48.0	89
MRS 51	3244	41.9	63	104	172	0	447	66.4	49.8	41
MRS 52	3143	53.0	68	109	170	4	394	51.8	44.2	68
MRS 53	3591	47.2	68	108	166	7	375	59.2	46.4	26
DO 837	3455	47.7	64	105	185	1	431	56.7	46.8	
MRS 55	3306	48.6	70	113	167	5	389	57.9	46.3	67
P6425HO	3145	48.1	71	114	186	6	420	44.5	46.0	92
PXF 391	3494	49.3	67	106	172	11	430	55.2	46.7	81
P9W1547	3401	49.9	64	104	162	9	430	49.6	47.9	86
P8V0073	3328	49.6	69	110	179	44	411	54.7	46.8	78
X16270	3656	48.1	67	112	164	0	432	54.3	48.8	65
Ex 1990	3017	52.0	68	111	163	0	411	47.7	42.3	92
Sig 846	3300	47.4	69	113	172	13	432	50.8	46.6	90
ST 439	3106	46.8	71	114	189	3	417	42.8	48.1	91
Dekalb 3785	3604	49.9	67	111	166	0	430	44.6	46.2	61
Dekalb 3790	3514	50.4	68	114	165	0	462	47.6	48.1	52
EX 8812	3468	49.0	66	111	164	13	415	51.5	46.1	93
IS 65122	3442	49.4	66	108	172	0	404	48.1	45.[illegible]	95
MRS 54	2882	50.6	69	109	164	3	411	47.3	46.9	97
C.V.%	5.7	1.8	1.2	1.6	4.5	177	2.1	7.7	3.2	
LSD (.05)	284	1.3	1.2	2.6	11.5	14	12.5	5.6	3.2	

Seeded May 16 on legume stubble.

Table 4. Performance data from Killarney Oilseed Sunflower Trial, 1991

Hybrid	Yield kg/ha	Oil %	Height cm	Density kg/m²	Wt/1000 seeds, g	Meal Prot. %
Hysun 340	2804	44.7	185	335	49.6	45.1
P6322	2891	47.5	171	387	50.9	45.6
P6440	2869	44.6	198	358	46.8	48.1
C207	3248	43.2	193	394	56.9	47.9
SF 187	2916	42.2	172	361	45.6	47.1
Sig 422	3095	44.8	169	434	58.2	48.3
Sig 465A	3214	42.9	182	382	49.8	47.5
Sig 452	2965	45.9	180	395	47.6	45.7
Trisun 849	2723	43.6	182	378	46.4	45.8
Sunwheat 101	2670	41.7	118	379	51.4	47.7
Sunwheat 103	2707	42.5	118	394	79.6	52.0
ST 330	3024	44.2	172	401	47.1	46.9
ST 310	2634	45.5	148	390	43.4	44.1
ST 880165	2506	46.9	167	370	43.2	45.0
Dakota Gold 2	2569	48.5	160	381	47.8	45.0
Dekalb 399	3175	44.7	165	377	50.1	43.2
Dekalb 3840	2847	44.9	175	312	44.0	45.9
Dekalb 3800	2389	43.8	188	363	50.2	45.0
Dekalb 3861	2523	43.2	188	370	44.8	43.9
Dekalb 3946	3094	45.4	160	392	57.6	45.6
Sunbred 268	3067	45.5	187	360	59.8	46.1
DO 707	3388	46.4	171	384	51.8	46.2
DO 855	3032	45.8	167	384	49.6	45.4
DO 827	3349	45.7	164	401	52.1	47.3
S1888	2685	43.9	184	384	42.0	43.8
S1296	3227	45.3	170	398	54.7	45.9
Sunbred 265	2936	44.6	171	378	56.6	47.9
Challenger	2980	45.7	168	380	49.2	46.1
Capri	3048	47.7	157	397	52.1	45.6
Cadet	3170	46.5	164	404	52.8	45.8
IS 7111	2972	46.7	179	360	50.0	46.4
IS 7000	2971	47.3	174	375	55.0	46.2
MRS 40	3107	44.3	157	392	48.9	47.3
IS 7101	2794	43.8	185	367	45.3	47.0
Isoleic	2512	43.5	185	356	52.7	46.5
IS 6111	3538	44.3	161	404	52.6	47.4
Sig 458	2542	49.7	177	420	50.1	47.8
PAC 7622	3056	42.9	171	397	49.4	46.1
Garst 7752	3023	42.5	162	401	43.5	47.4
Garstoil 1000	2759	43.7	174	365	48.6	49.3
MRS 50	2205	42.9	181	330	52.4	47.0
MRS 51	3123	41.5	180	421	71.9	49.7
MRS 52	2351	49.3	169	357	51.5	45.3
MRS 53	2440	42.8	172	354	53.2	47.2
DO 837	2979	46.4	188	389	61.3	46.0
P6425HO	2663	44.8	179	358	45.2	45.2
PXF 391	3146	46.4	170	401	56.6	48.9
P9W1547	3207	48.2	162	403	52.5	45.2
P8V0073	3126	47.5	170	385	54.7	46.1
X16270	3328	46.7	168	397	49.9	49.8
Ex 1990	2546	48.7	163	378	50.5	42.5
Sig 846	3042	43.3	167	362	53.6	46.2
ST 439	2543	43.3	188	382	41.0	46.0
Dekalb 3785	3061	48.6	165	406	41.9	42.3
Dekalb 3790	3109	47.7	172	410	43.7	44.2
EX 8812	3195	46.1	166	383	51.3	46.5
IS 65122	2877	46.0	170	382	52.1	48.3
MRS 54	2363	47.2	163	386	52.2	47.8
C.V.%	7.6	1.9	4.5	2.1	6.1	2.6
LSD (.05)	324	1.3	10.5	11.5	4.6	2.4

Seeded May 23 on cereal stubble.

Table 5. Performance data from Holland Oilseed Sunflower Trial, 1991

Hybrid	Yield kg/ha	Oil %	Density kg/m^3	Wt/1000 seeds, g
Hysun 340	2876	46.0	348	48.1
P6322	2549	48.3	390	46.7
P6440	2569	47.3	385	45.0
C207	2649	42.1	400	50.5
SF 187	3023	45.1	383	51.2
Sig 422	2467	45.0	423	54.8
Sig 465A	2717	45.2	396	47.9
Sig 452	2789	46.2	397	43.5
Trisun 849	2302	45.0	379	42.6
Sunwheat 101	2347	41.4	376	51.3
Sunwheat 103	2201	45.5	374	65.7
ST 330	2745	45.7	410	47.0
ST 310	2765	47.0	406	40.3
ST 880165	2627	48.5	378	41.3
Dakota Gold 2	2644	49.6	388	46.6
Dekalb 399	2820	45.4	382	47.9
Dekalb 3840	2650	45.1	380	41.7
Dekalb 3800	2962	47.7	372	47.3
Dekalb 3861	2826	47.6	377	47.3
Dekalb 3946	2554	44.6	386	48.6
Sunbred 268	2708	45.7	374	52.6
DO 707	2957	45.0	397	49.8
DO 855	2418	48.2	403	48.7
DO 827	3003	46.0	416	49.7
S1888	2582	45.6	388	38.8
S1296	2351	45.5	401	48.8
Sunbred 265	2706	47.2	395	53.0
Challenger	2802	46.2	382	46.9
Capri	2840	47.9	408	51.0
Cadet	2603	45.9	392	46.5
IS 7111	2267	46.9	373	49.0
IS 7000	2586	49.0	373	51.9
MRS 40	2686	46.2	411	47.5
IS 7101	2547	45.5	377	43.5
Isoleic	2478	46.3	391	52.3
IS 6111	2925	45.5	396	51.1
Sig 458	2473	50.7	422	46.0
PAC 7622	2567	42.7	406	47.5
Garst 7752	2725	46.2	399	47.1
Garstoil 1000	2869	47.2	381	50.2
MRS 50	2443	43.5	341	49.9
MRS 51	2751	42.7	417	62.8
MRS 52	2465	51.0	355	48.0
MRS 53	2319	43.1	346	50.0
DO 837	2627	45.8	388	59.2
MRS 55	2813	46.8	360	59.6
P642SHO	2224	46.9	393	40.7
PXF 391	2459	47.7	402	49.9
P9W1547	2639	49.8	405	51.2
P8V0073	2424	47.2	376	49.1
X16270	2769	47.2	390	50.0
Ex 1990	2466	49.7	391	45.9
Sig 846	2899	44.0	366	49.1
ST 439	2181	44.6	386	39.7
Dekalb 3785	2929	48.7	404	39.7
Dekalb 3790	2651	48.3	422	43.4
EX 8812	2909	47.8	394	47.3
IS 65122	2897	48.3	386	49.5
MRS 54	2395	47.8	383	47.8
C.V.%	10.9	3.1	2.7	7.0
LSD (.05)	430	2.1	14.4	5.0

Seeded May 24 on cereal stubble.

Table 6. Performance data from Neepawa Oilseed Sunflower Trial, 1991

Hybrid	Yield kg/ha	Oil %	Density kg/m³	Wt/1000 seeds, g
Hysun 340	3182	44.2	354	51.5
P6322	3401	49.2	411	55.3
P6440	2565	45.9	386	48.4
C207	3171	42.7	426	55.8
SF 187	3021	43.2	392	50.7
Sig 422	2924	43.2	418	58.2
Sig 465A	3079	43.9	407	51.5
Sig 452	3192	46.9	414	52.2
Trisun 849	2489	43.5	387	48.5
Sunwheat 101	2226	40.7	373	51.5
Sunwheat 103	2583	41.8	370	71.4
ST 330	2773	43.9	415	49.3
ST 310	3101	46.7	412	45.8
ST 880165	3269	49.6	398	48.9
Dakota Gold 2	2864	47.6	392	51.0
Dekalb 399	3175	45.4	389	53.7
Dekalb 3840	3161	46.0	398	50.1
Dekalb 3800	3509	47.2	385	53.3
Dekalb 3861	3044	47.2	404	51.7
Dekalb 3946	3057	45.5	396	57.4
Sunbred 268	2974	45.3	377	62.1
DO 707	3143	44.2	397	59.2
DO 855	2908	45.3	393	53.2
DO 827	3489	45.1	421	55.6
S1888	2895	44.5	406	44.0
S1296	3318	44.9	404	57.6
Sunbred 265	2796	45.3	404	55.6
Challenger	2939	46.7	386	51.5
Capri	3255	46.9	402	58.6
Cadet	2803	44.5	384	50.6
IS 7111	2913	48.1	380	53.8
IS 7000	2591	46.5	378	55.8
MRS 40	2683	44.0	390	47.3
IS 7101	2871	45.5	401	47.3
Isoleic	2625	46.2	391	51.7
IS 6111	3269	44.1	409	56.9
Sig 458	2872	51.5	423	49.2
PAC 7622	2991	42.5	415	53.1
Garst 7752	2961	44.4	406	49.0
Garstoil 1000	2776	46.1	404	51.4
MRS 50	2954	44.2	348	53.8
MRS 51	3008	42.1	421	66.1
MRS 52	2828	48.2	371	52.1
MRS 53	2744	42.1	353	57.3
MRS 55	3316	46.0	370	65.2
P6425HO	2591	46.7	406	44.3
PXF 391	3181	47.9	420	56.1
P9M1547	3262	48.0	412	53.6
P8V0073	3341	48.2	405	55.7
X16270	2798	44.7	392	53.4
Ex 1990	2922	47.6	377	48.6
Sig 846	2875	41.8	373	52.0
ST 439	2570	43.5	412	46.8
Dekalb 3785	2976	46.4	408	45.7
Dekalb 3790	3113	46.1	425	46.7
EX 8812	3331	46.8	399	52.0
IS 65122	2929	47.0	381	51.3
MRS 54	2932	44.5	389	60.5
C.V.%	9.6	2.9	2.8	5.9
LSD (.05)	429	1.9	16	4.7

Seeded May 21 on cereal stubble

Table 7. Performance Data from Brandon Oilseed Sunflower Trial, 1991.

Hybrid	Yield kg/ha	Oil %	Days to Bloom	Height cm
Hysun 340	2502	45.3	71	144
P6322	1828	48.8	72	150
P6440	2304	46.0	76	157
C207	2541	42.4	73	162
SF 187	2603	43.3	74	149
Sig 422	2392	43.5	67	143
Sig 465A	2870	44.1	73	145
Sig 452	2699	46.9	71	143
Trisun 849	1987	44.1	72	151
Sunwheat 101	1989	39.7	64	108
Sunwheat 103	1838	41.1	58	103
ST 330	2314	44.6	71	157
ST 310	2846	47.2	72	138
ST 880165	2730	49.2	74	156
Dakota Gold 2	1766	47.6	71	141
Dekalb 399	2459	45.9	69	145
Dekalb 3840	2715	45.7	73	146
Dekalb 3800	2224	48.6	72	146
Dekalb 3861	2153	46.8	75	150
Dekalb 3946	2426	45.7	68	135
Sunbred 268	2493	45.8	74	152
DO 707	2855	44.6	70	149
DO 855	2736	46.1	69	152
DO 827	3090	44.9	70	157
S1888	2631	46.2	72	146
S1296	2988	44.7	70	153
Sunbred 265	2843	46.0	71	146
Challenger	2422	45.0	71	142
Capri	2158	46.6	71	122
Cadet	2305	46.0	70	140
IS 7111	2554	48.4	72	146
IS 7000	2608	48.6	69	149
MRS 40	2153	43.3	68	138
IS 7101	2224	43.9	70	156
Isoleic	2494	44.2	78	153
IS 6111	2665	43.9	69	145
Sig 458	1833	47.8	76	117
PAC 7622	2695	42.8	70	151
Garst 7752	3329	45.9	72	144
Garstoil 1000	2739	44.9	74	152
MRS 50	2249	43.9	72	153
MRS 51	2747	41.3	68	153
MRS 52	2318	48.5	71	144
MRS 53	2239	43.4	71	135
DO 837	1769	45.7	68	155
MRS 55	2877	46.9	73	143
P6425HO	2485	45.1	75	158
PXF 391	2648	47.1	71	146
P9W1547	2642	48.7	69	146
P8V0073	2103	48.0	73	152
X16270	3333	47.5	72	149
Ex 1990	2398	49.7	71	143
Sig 846	2907	45.4	73	145
ST 439	2940	45.9	72	161
Dekalb 3785	2489	49.2	71	133
Dekalb 3790	2757	48.7	71	141
EX 8812	2807	47.3	71	143
IS 65122	2239	46.5	71	137
C.V.%	21.1		1.9	5.5
LSD (.05)	787		2	12
Mean	2499	45.8		

Seeded May 24.

Table 8. Manitoba Oilseed Sunflower Committee Trials 1990-91 Combined.

Hybrid	Yield kg/ha	Oil %	Days to 80% Bloom	Days to Mature	Height (cm)	Lodging %	Density (kg/m^3)	Wt/1000 seeds (g)	Meal Protein %
Candidate									
DEK 3785	3201	50.4	73	113	148	4	422	44.3	45.0
9W1547	3120	50.4	71	108.8	151	9	423	51.8	47.5
8812	3088	49.1	72	113	149	6	410	50.1	46.3
PAC 7622	3056	45.3	74	114	153	7	428	51.0	50.3
MRS 50	2718	46.0	73	107	158	23	359	52.8	49.3
High oleic									
Sig 846	3011	46.0	75	115	153	8	389	49.9	46.3
ST 439	2749	46.7	76	115	167	11	407	42.5	47.0
P6425HO	2715	47.8	77	117	169	8	400	45.2	46.2
Registered or Supported									
SF 187	3234	46.2	76	115.3	149	2	391	47.2	47.6
S1296	3103	47.3	72	112	158	8	418	51.6	48.9
IS 7111	2894	49.9	73	111.3	157	4	394	52.1	48.7
880165	3044	50.8	76	115.5	164	3	395	44.0	44.7
C207	3157	44.1	75	114.5	176	8	418	55.4	48.5
Cadet	3033	48.3	71	111	151	3	415	49.7	47.6
Capri	2958	49.5	72	113.5	144	2	417	52.9	47.0
Challenger	3046	48.1	73	113.5	155	7	400	46.7	46.9
Dak Gold 2	2901	51.3	73.5	112	155	5	402	47.0	47.0
DEK 3800	3140	49.2	75	114	159	15	394	50.0	46.2
DEK 3840	3150	47.7	75.5	115.5	159	2	412	46.3	47.6
DEK 3861	3087	48.9	77.5	117	161	13	399	48.8	46.0
DEK 3946	3037	48.4	72	113	149	0	405	51.6	46.7
DEK 399	3131	47.9	72	112.5	155	1	400	50.5	44.8
DO 707	3175	47.5	71.5	115	157	6	406	50.9	46.9
DO 827	3191	47.3	70	113	157	6	424	50.6	47.8
DO 837	2838	46.8	69	107	171	2	409	59.9	48.2
DO 855	2900	47.8	73	113	160	10	406	52.4	47.1
Hysun 340	3030	47.0	74.5	117	160	5	362	50.5	47.0
IS 6111	2928	47.3	73	113.5	157	1	425	50.2	48.8
IS 7000	2835	49.3	71	109.5	161	1	393	56.4	48.6
IS 7101	2931	47.0	74	111	165	8	397	45.9	48.0
MRS 40	2917	47.3	69	109	145	7	412	46.4	47.3
P6322	3134	50.5	74	111	158	3	409	50.5	46.2
P6440	2933	48.4	77	115.5	167	0	391	49.1	49.2
Sig 422	2862	45.6	69	109	152	2	433	54.1	48.6
Sig 452	3034	49.2	73	114.5	153	7	411	46.6	46.5
Sig 458	2752	52.7	75	114.5	151	3	441	49.1	48.7
Sig 465A	3029	46.3	74	116	159	9	406	47.4	48.2
ST 310	2864	48.7	74.5	113.5	144	2	418	42.4	46.5
ST 330	2944	46.3	74	116	160	6	424	47.2	47.5
Sunbred 268	2953	47.0	75	114	172	5	386	60.2	48.4
Sunwheat 101	2555	42.6	70	108	108	2	393	53.0	49.4
Sunwheat 103	2371	44.2	60	102	107	0	394	68.0	52.2
High oleic									
Isoleic	2696	47.0	78	118.5	164	2	396	51.6	48.3
Trisun 849	2634	46.6	75	115	166	12	404	46.6	47.6

11 station years: 1990 - Altona, Morden, Holland, Neepawa, Brandon, Lyleton
1991 - Altona, Morden, Holland, Killarney, Neepawa

Table 9. Summary of data from the 1991 Manitoba Nonoil Sunflower Trial (3 stations)

Hybrid	Yield kg/ha	Days to 80% Bloom	Days to Mature	1000 seed wt. g	% over screen			Density kg/m^3	Nut-meat %
					20	18-20	16-18		
D171	3257	68.5	109	93.5	32.7	40.1	17.1	311	58.3
D131	3103	70.5	114	103.5	37.0	40.1	14.4	317	54.6
IS8004	3075	68.5	111	105.7	49.8	31.1	10.7	323	56.7
D151	3017	70.5	111	100.9	43.3	34.0	13.6	314	59.3
2141	2935	69	110	90.8	16.3	42.9	27.4	336	59.6
Sig 964	2864	68	107.5	91.2	24.2	41.2	22.3	313	58.3
Sig 954	2856	68	110	109.4	49.0	35.1	10.5	312	58.1
Sig 974	2844	70	112.5	106.4	56.2	23.5	8.3	300	57.5
MRS 589	2817	68	112	89.2	10.4	26.5	28.9	338	62.1
MRS 560	2417	65	103.5	90.7	13.6	41.5	30.6	329	58.3
Mean	2919	68.6	110	98.1	33.2	35.6	18.4	319	58.3
C.V.%	3.6	1.2	1.7	4.5	15.5	12.1	11.9	2.3	2.5
LSD (.05)	181	1.9	4.2	8.1	8.8			13	2.5

Table 10. Performance data from Altona Nonoil Sunflower Trial, 1991

Hybrid	Yield kg/ha	Days to 80% Bloom	Days to Mature	1000 seed wt. g	% over screen			Density kg/m^3	Nut-meat %
					20	18-20	16-18		
R2141	2840	70	110	91.1	16.7	42.3	28.0	332	59.7
Sig 954	2828	70	110	115.3	49.2	34.5	10.4	329	57.1
Sig 964	2923	69	108	97.8	26.3	42.3	20.6	320	56.2
Sig 974	2915	71.5	112.5	113.2	51.8	20.2	7.6	312	57.8
D131	3085	72	114	104.9	37.4	38.5	15.2	321	56.3
D151	3008	71	111	101.0	39.5	34.5	15.1	323	59.0
D171	3233	69	107.5	90.5	28.1	42.6	17.3	321	57.5
IS 8004	3081	69	109.5	98.8	42.7	36.1	11.2	330	56.9
MRS 560	2417	67	106	93.1	10.9	43.3	32.9	337	57.5
MRS 589	2863	69	110	87.4	7.0	25.2	27.7	355	61.9
Mean	2919	69.7	110	99.3	31.0	36.0	18.6	328	58.0
C.V.%	7.3	1.2	1.5	4.9	35.1	15.3	14.0	4.2	3.8
LSD (.05)	309	1.3	2.4	7.0	15.8			20	3.2

Planted May 14 on cereal stubble.

Table 11. Performance data from Morden Nonoil Sunflower Trial, 1991

Hybrid	Yield kg/ha	Days to 80% bloom	Days to Mature	Height cm	Lodging %	1000 Seed wt. g.	% over screen			Density kg/m^3	Nut-meat %	Self Comp %
							20	18-20	16-18			
RH 2141	3245	68	110	189	21	92.4	12.8	43.5	28.5	346	60.9	
Sig 954	3121	66	110	183	22	109.0	52.9	32.2	9.8	310	59.7	
Sig 964	3004	67	107	186	22	89.4	22.1	45.6	20.3	311	61.2	
Sig 974	3014	68	112.5	199	31	105.4	54.1	27.4	9.4	300	56.9	
D131	3410	69	113.5	182	14	105.2	25.9	48.5	15.9	327	53.7	
D151	3411	70	111.5	182	11	100.2	38.2	39.3	13.4	321	61.2	
D171	3464	68	111	169	28	93.0	26.3	40.3	19.9	313	61.6	
IS 8004	3301	68	112	194	10	108.4	43.2	33.8	12.7	330	56.4	
MRS 560	2534	63	101	173	34	86.0	10.0	43.7	31.4	321	58.4	55
MRS 589	2833	67	114.5	164	14	90.2	8.6	23.2	27.5	336	61.6	16
Mean	3133	67.4	110	182	21	97.9	29.4	37.7	18.9	321	59.2	13
C.V.%	9.7	.97	2.3	4.1	65	4.4	22.2	16.6	18.4	3.2	4.1	
LSD (.05)	486		3.7	10.8	20	6.2	9.5			14.9	3.5	

Planted May 16 on pea stubble, Treflan treated land.

Table 12. Performance data from Holland Nonoil Sunflower Trial, 1991.

Hybrid	Yield kg/ha	1000 seed wt. g	% over screen			Density kg/m^3	Nut-meat %
			20	18-20	16-18		
2141	2721	89	19.3	42.8	25.6	329	58.3
Sig 954	2618	104	44.8	38.6	11.4	298	57.6
Sig 964	2666	86.5	24.2	35.7	26.0	309	57.6
Sig 974	2604	100.5	62.8	22.8	8.0	287	57.8
D131	2813	100.5	47.8	33.2	12.2	304	53.8
D151	2633	101.5	52.3	28.2	12.2	298	57.8
D171	3075	97	43.6	37.4	14.2	298	55.9
IS 8004	2843	110	63.4	23.3	8.2	310	56.8
MRS 560	2301	93	19.8	37.4	27.4	330	59.0
MRS 589	2754	90	15.6	31.1	31.6	323	62.8
Mean	2703	97.4	39.4	33.4	17.7	309	57.7
C.V.%	6.9	4.7	18.3	19.2	21.3	2.2	3.3
LSD (.05)	271	6.8	10.5			9.9	2.8

DISEASE REACTIONS OF THE MANITOBA SUNFLOWER COOPERATIVE TEST, 1991

prepared by K. Y. Rashid

The 21 entries and 38 checks of oilseed sunflower hybrids plus three entries and seven checks of non-oil hybrids in the Manitoba Sunflower Cooperative Test were evaluated for four diseases in 1991 (Table A). Rust evaluation was conducted under field conditions at Morden, Altona, Holland, Neepawa, Killarney and Brandon to natural rust infestation. Reaction to verticillium wilt was evaluated in naturally infested field at Morden Research Station and the Elias farm, 10 km north of Morden. Reaction to downy mildew race 2 was performed under controlled growth room conditions. Additional data is presented on the field reaction of the hybrids to natural downy mildew infections at Morden where the incidence was generally very high. Evaluation for sclerotinia wilt was conducted in naturally infested fields at Morden Research Station and at the Elias farm. Rust spread was slow early in the season and increased towards the end of the season, however, rust severity was less than previous years. Conditions were un favorable for sclerotinia wilt early in the season, but became favorable towards the end of the season, and resulted in very low incidence and severity especially in the test nurseries. This report presents the results of 2- to 4-year data on the reactions of all the recommended and candidate entries (Table B). The data on evaluation to sclerotinia was unrealistic, and was not included with 2-, and 3-year means in Table B

Reaction of candidate hybrids

Reaction of the Oilseed hybrids (Tables A and B)

No objection to the recommendation for registration for hybrids MRS 50, ST 439, and EX 8812 since they meet the minimum requirements for disease resistance. The hybrids DK 3785, PAC 7622, 9W 1547, 6425HO, ans Sigco 846 are moderately susceptible to verticillium wilt (score -1) and thus require at least +3 points above the mean of the checks in order to be supported for registration.

Reaction of the Non-Oilseed Hybrids (Tables A and B)

Hybrid MRS 589 is moderately susceptible to rust, to verticillium wilt, and to downy mildew and thus require at least 3 points above the mean of the checks in order to be supported for registration .

NOTE: Treated seed received for some hybrids in 1991 in spite of the request for non-treated seed for disease testing. Some of these hybrids showed high scores (ESCAPE) in non-hulled downy mildew seedling tests and in field evaluation (see Tables A and B for details).

Table A. Disease Reactions of the 1991 Sunflower Cooperative test.

Hybrids	Reaction to Rust[1]							Reaction to Verticillium Wilt[2]					% Resistance to Downy Mildew[3]		% Resistance to Sclerotinia Wilt[4]	
	Alt.	MRS	Hol.	Nep.	Kil.	Brn.	Mean Index	%Healthy & Mild	% Mod.	%Severe & Dead	Mean Index MRS	Mean Index Eli	G.H.	Field	MRS	Elias
Checks																
C 207	2.5	2.5	1.5	1.5	2.0	0.5	1.8	96	3	1	1.1	1.6	39T	100T	100	92
SF 187	2.0	1.5	1.0	0.5	1.5	0.5	1.0	98	2	0	1.0	1.2	4T	99T	100	92
P 6322	2.0	2.3	2.0	1.5	1.5	0.5	1.8	87	9	4	1.4	2.1	88	76	100	97
P 6440	3.0	2.3	1.0	.	1.0	0.5	1.5	90	8	2	1.2	2.4	87T?	50T?	100	98
Cadet	2.0	1.5	1.5	0.8	2.0	1.5	1.5	77	95	2	1.2	1.0	80	49	100	100
Capri	1.5	1.5	1.0	1.0	0.8	0.5	1.0	98	1	0	1.1	1.3	94T	100T	100	98
Challenger	1.5	1.8	0.5	1.0	1.5	0.5	1.3	89	8	3	1.3	1.5	73	64	100	100
Dakota Gold II	2.5	1.8	1.5	1.0	1.5	0.5	1.5	98	1	1	1.1	1.4	31	76	100	97
DO 707	2.5	1.5	1.0	0.5	1.5	0.5	1.3	80	16	3	1.5	1.9	80T?	82T?	100	96
DO 827	1.5	2.0	0.5	1.5	1.0	0.5	1.2	87	11	2	1.3	1.9	96T?	72T?	100	96
DO 837	2.5	2.3	1.0	2.0	2.0	0.5	1.8	65	20	11	2.0	3.5	63	81	100	93
DO 855	2.0	1.3	0.5	0.5	1.5	0.5	1.0	79	17	4	1.5	3.9	94	68	99	100
Hysun 340	2.5	2.0	1.0	1.5	0.8	0.5	1.5	71	19	11	1.8	2.9	2T?	95T?	100	98
IS 7000	2.0	2.8	2.5	1.5	1.0	1.0	1.8	95	5	1	1.1	1.7	44	76	99	97
7101	2.5	2.0	2.0	0.8	1.5	0.5	1.5	82	11	7	1.5	2.4	90	78	98	99
IS 7111	1.0	1.3	1.0	1.0	1.5	0.5	1.0	93	6	1	1.2	1.8	71	71	99	91
Isoleic	2.5	1.8	2.0	1.0	1.0	0.5	1.5	87	11	2	1.3	1.1	71	58	100	98
MRS 40	2.0	1.0	1.0	1.0	1.0	0.5	1.0	97	2	1	1.1	1.3	62	45	100	99
S1296	3.5	1.8	2.5	1.0	1.0	1.0	1.8	93	6	1	1.1	1.6	68	77	100	98
S 1888	1.0	1.8	1.0	2.0	1.5	0.5	1.3	97	3	0	1.1	1.3	88	72	100	97
ST 310	1.5	1.5	1.5	1.0	1.5	0.5	1.3	96	3	1	1.1	1.2	90	89	100	98
ST 330	1.5	1.0	0.5	1.0	0.5	0.5	1.0	97	3	1	1.1	1.3	41	70	100	100
Sig 422	3.0	2.0	1.0	0.8	1.5	0.8	1.5	94	4	2	1.0	1.3	92T	97T	100	93
Sig 452	2.0	1.5	1.0	0.5	1.5	0.5	1.3	97	3	0	1.1	1.2	92T	100T	100	97
Sig 458	1.5	0.8	1.0	0.5	1.0	0.5	1.0	92	7	1	1.1	1.2	84T	99T	100	98
Sig 465A	2.0	1.0	1.0	2.0	1.5	1.0	1.5	96	3	1	1.1	1.4	96T	98T	100	96
SMT 101	3.0	2.3	1.5	1.0	1.5	1.0	1.8	88	9	3	1.4	2.0	54	71	100	96
SMT 103	4.0	2.8	1.5	1.5	1.5	0.5	2.0	87	13	0	1.2	2.6	30	61	100	91
Trisun 849	1.5	1.3	1.5	1.0	1.5	0.5	1.3	87	8	5	1.3	1.2	64T?	88T?	100	94
DK 3800	1.5	1.3	1.0	1.0	1.0	0.5	1.0	96	4	0	1.1	1.1	100	93	100	97
DK 3840	2.0	0.8	1.5	1.0	1.0	0.5	1.3	97	1	1	1.1	1.5	98T?	69T?	100	99
DK 3861	1.5	1.0	1.0	0.5	2.0	0.5	1.0	99	1	1	1.1	1.2	100	85	100	92
DK 399	2.0	2.3	2.0	1.5	1.5	0.5	1.8	99	0	0	1.0	1.6	92	70	100	94
DK 3946	2.0	1.3	2.0	2.0	1.5	0.5	1.7	93	6	1	1.2	1.4	94	88	99	94
IS 6111	1.5	1.3	2.0	1.0	1.0	0.5	1.3	98	1	1	1.1	1.1	79T?	65T?	100	100
SUNBRED 265	1.5	1.0	0.5	0.5	0.5	0.5	0.8	99	1	0	1.0	1.1	40	62	100	99
SUNBRED 268	3.0	1.8	1.0	2.5	1.5	0.5	1.8	72	22	4	1.6	3.5	44T	99T	99	93
ST 880185	2.0	1.8	2.0	1.0	1.0	0.5	1.5	95	4	1	1.1	1.0	92	62	100	97
2-Year Entry																
MRS 50	2.5	2.0	2.0	1.5	1.0	0.5	1.5	95	4	1	1.1	2.0	95	51	100	94
DK 3785	1.5	2.3	1.0	0.8	0.5	0.5	1.0	78	13	9	1.6	2.8	98T	99T	100	97
PAC 7622	1.0	0.7	0.5	0.5	0.8	0.3	0.8	86	13	1	1.3	1.6	79	100	100	94
SW1547	2.5	1.5	1.0	0.5	1.0	0.5	1.3	76	15	9	1.7	3.5	58	76	100	97
ST439	2.5	2.3	2.0	1.5	2.0	0.8	2.0	93	5	2	1.2	1.1	71	71	100	97
EX 8812	1.5	0.8	1.0	0.5	1.5	0.5	1.0	99	1	0	1.0	1.6	82	85	100	99
642HO	2.5	2.0	1.5	1.0	0.8	0.5	1.5	73	15	13	1.8	4.0	100	51	100	97
Sigco 848	2.5	1.5	2.5	3.0	1.0	0.5	2.0	76	16	8	1.5	2.1	64T?	90T?	100	97

Table A. (Cont.)

Hybrids	Reaction to Rust[1]							Reaction to Verticillium Wilt[2]					% Resistance to Downy Mildew[3]		% Resistance to Sclerotinia Wilt[4]	
	Alt.	MRS	Hol.	Nep.	Kil.	Brn.	Mean Index	%Healthy & Mild	% Mod.	%Severe & Dead	Mean Index MRS	Mean Index Eli	G.H.	Field	MRS	Elias
1-Year Entry																
XF 391	4.0	2.5	1.5	1.0	1.0	0.5	1.8	84	12	4	1.4	1.7	71	55	100	97
8V0073	2.0	2.8	2.0	0.5	1.5	0.8	1.5	52	25	23	2.4	3.6	92	53	100	98
Garst 1000	2.0	1.5	2.0	0.5	1.0	0.5	1.3	97	3	0	1.0	1.0	73T	94T	100	99
Garst 7752	1.0	0.8	0.5	0.5	0.5	0.5	0.8	81	11	8	1.6	1.6	6	65	99	92
IS 65122	2.0	1.8	1.5	1.0	0.8	0.5	1.3	82	11	7	1.5	2.9	80T?	78T?	99	93
X 16270	1.5	1.5	1.0	1.0	0.5	0.5	1.0	77	11	12	1.7	2.4	2T	99T	99	96
DK 3790	2.0	1.8	1.5	1.0	1.0	0.5	1.3	77	15	12	1.8	2.8	100T	98T	100	95
SIGO 1990	1.0	1.0	1.0	1.0	0.5	0.5	1.0	97	3	0	1.1	1.3	7	61	100	94
MRS 51	3.0	2.8	2.0	1.0	2.0	1.0	2.0	91	8	1	1.2	1.5	100	100	99	92
MRS 52	1.5	1.5	1.0	0.5	0.5	0.8	1.0	94	5	1	1.1	1.5	7	64	100	94
MRS 53	2.0	1.5	1.5	1.0	1.0	0.5	1.3	92	5	3	1.2	1.1	2	98	100	98
MRS 54	2.5	2.5	1.5	.	1.5	.	2.0	96	2	2	1.1	1.3	64	68	100	95
MRS 55	1.0	2.3	1.0	0.7	.	0.5	1.0	92	8	0	1.2	2.0	100	89	97	93
Non-Oil Checks																
RH 2141	2.5	.	2.0	.	.	.	.	.	.	.	.	.	.	.		
D 131	2.5	2.5	1.0	.	.	.	2.0	93	5	2	1.2	1.2	.	84	100	97
D 151	2.5	2.8	1.5	.	.	.	2.3	87	5	7	1.4	1.3	28T?	83T?	100	94
SIGCO 954	2.5	3.5	3.0	.	.	.	3.0	77	13	10	1.6	3.0	53	99	100	98
SIGCO 964	3.5	3.3	3.5	.	.	.	3.5	76	12	12	1.7	3.3	35T	96T	100	97
SIGCO 974	4.0	3.5	3.5	.	.	.	3.6	85	10	5	1.4	2.4	35T	99T	100	93
IS 8004	3.0	2.8	2.0	.	.	.	2.5	25	32	43	3.3	3.8	10	86	100	98
4-Year Entry																
MRS 589	2.5	3.0	1.5	.	.	.	2.5	71	15	14	1.9	2.2	63	80	100	96
1-Year Entry																
MRS 560	4.0	3.5	4.5	.	.	.	4.0	33	34	32	3.0	4.5	45	82	100	97
D 171	2.0	2.0	1.0	.	.	.	1.8	97	2	2	1.1	1.4	32T?	69T?	100	100

1 Field reaction to natural rust infections at Altona, Morden, Holland, Neepawa, Killarney and Brandon (races 3 and 4 predominant). Indices 1 to 5 based on % leaf area infected; 1=highly resistance (0-5%); 2=moderately resistant (5-10%); 3=moderately susceptibility (10-30%), 4= susceptible (30-50%); and 5=high susceptibility (>50%) were assigned.

2 Field reaction to verticillium wilt in naturally infested soil at Morden and 10 km north of Morden (Elias farm). Indices of 1 (healthy & mild), 3 (moderate), and 5 (severe & dead) were assigned; the mean disease index was obtained by multiplying the number of plants in each class by the corresponding index, and the total divided by the total number of plants.

3 Reaction to downy mildew (race 2 Morden) under controlled growthroom conditions, and in naturaaly infested field.

T Treated seed received for these hybrids showed high scores (escape) in downy mildew testing.

4 Field reaction to sclerotinia wilt in naturally infested fields at Morden and the Elias farm, 10 km north of Morden.

Table 8. The Reactions of 2- or 4-Year Sunflower Cooperative Entries to 4 Diseases.

Hybrids	Rust[1]				Verticillium Wilt[2]					Downy Mildew[3]		Sclerotinia Wilt[4]			
	Mean Index				%Healthy	%	%Severe	Mean	Class	%		%healthy			Class
	Year	Morden	W.Man.	Class	& Mild	Mod.	& Dead	Index		Res.	Class	MRS	Nep	Elias	
Checks															
C 207	91	2.5	1.8		96	3	1	1.1		39T		100		92	
	90	1.0	2.0		92	6	2	1.2		15		97		42	
	89	1.4	3.5		97	3	0	1.1		12		76	94		
	88	1.0	4.0		97	3	0	1.1		55		76	62		
		(1.5)	(2.8)	MR				(1.1)	R	(30)	S				HS
SF 187	91	1.5	1.0		98	2	0	1.0		4T		100		92	
	90	1.6	1.0		96	3	1	1.1		43T		99		77	
	89	1.0	4.2		99	1	0	1.0		5		98	91		
	88	1.0	3.8		100	0	0	1.0		11		77	91		
		(1.3)	(2.5)	MR				(1.0)	R	(16)	HS				MS
6322	91	2.3	1.8		87	9	4	1.4		88		100		97	
	90	2.7	3.0		81	14	5	1.5		98		100		60	
	89	2.6	4.5		98	2	0	1.0		60		78	91		
	88	1.7	4.5		99	1	0	1.0		100		81	81		
		(2.3)	(3.5)	MS/S				(1.2)	MR	(87)	MR				S
6440	91	2.3	1.5		90	8	2	1.2		87T?		100		98	
	90	2.8	2.5		89	11	0	1.2		86		97		57	
	89	1.4	4.4		97	3	0	1.1		83		84	86		
	88	1.5	4.5		100	0	0	1.0		97		90	83		
		(2.0)	(3.2)	MS				(1.1)	R	(88)	MR				S
CADET	91	1.5	1.5		95	2	3	1.2		80		100		100	
	90	2.3	2.5		90	9	1	1.2		74		97		68	
	89	2.6	4.0		94	6	0	1.1		58		90	96		
	88	1.5	4.0		98	1	1	1.1		88		81	94		
		(2.0)	(3.0)	MS				(1.2)	MR	(75)	MS				MS
CAPRI	91	1.5	1.0		98	1	0	1.1		94T		100		98	
	90	1.0	1.0		100	0	0	1.0		73		98		80	
	89	1.2	3.9		99	1	0	1.0		23		91	89		
	88	1.0	2.8		100	0	0	1.0		56		87	83		
		(1.2)	(2.2)	MR				(1.0)	R	(62)	MS				MR
CHALLENGER	91	1.8	1.3		89	8	3	1.3		73		100		100	
	90	1.4	1.0		97	2	1	1.1		83		92		86	
	89	1.4	3.8		95	5	0	1.1		42		93	97		
		(1.5)	(2.0)	MR				(1.2)	MR	(66)	MS				MR
DAK.GOLD II	91	1.8	1.5		98	1	1	1.1		31		100		97	
	90	2.0	2.0		93	5	2	1.2		56		98		72	
	89	2.0	4.3		95	5	0	1.1		23		92	91		
		(1.9)	(2.6)	MS				(1.1)	R	(37)	S				MS

Table B. (Cont.)

Hybrids	Rust[1]				Verticillium Wilt[2]					Downy Mildew[3]		Sclerotinia Wilt[4]			
	Mean Index				%Healthy	%	%Severe	Mean	Class	%		%healthy			Class
	Year	Morden	W.Man.	Class	& Mild	Mod.	& Dead	Index		Res.	Class	MRS	Nap	Elias	
DO 707	91	1.5	1.3		80	16	3	1.5		80T?		100		96	
	90	1.7	1.5		81	12	7	1.5		65		100		76	
	89	2.2	3.7		93	7	0	1.2		67		89	89		
	88	1.4	3.5		98	2	0	1.1		95		81	77		
		(1.7)	(2.5)	MS				(1.3)	MR	(77)	MS				MS
DO 827	91	2.0	1.2		87	11	2	1.3		98T?		100		96	
	90	2.0	2.0		75	19	6	1.6		93		99		74	
	89	2.2	4.2		94	6	0	1.1		90		91	97		
	88	1.5			98	2	0	1.1		85		76	79		
		(1.9)	(2.5)	MS				(1.3)	MR	(91)	R				MS
DO 837	91	2.3	1.8		65	20	11	2.0		63		100		93	
	90	2.0	1.5		69	20	11	1.8		89		96		43	
	89	1.0	4.4		88	12	0	1.3		52		76	87		
		(1.8)	(2.6)	MS				(1.7)	MS	(68)	MS				MS
DO 855	91	1.3	1.0		79	17	4	1.5		94		99		100	
	90	1.8	2.0		81	17	2	1.4		93		99		56	
	89	1.2	4.1		82	18	0	1.4		84		90	94		
		(1.4)	(2.4)	MR				(1.4)	MR	(90)	R				S
HYSUN 340	91	2.0	1.5		71	19	11	1.8		ZT?		100		98	
	90	1.2	1.0		66	26	8	1.8		59T		100		63	
	89	1.2	.		86	14	0	1.3		6		96	93		
	88	1.0	2.8		98	1	1	1.1		4		70	82		
		(1.4)	(1.8)	MR				(1.5)	MS	(18)	MS				MS
IS 7000	91	2.8	1.8		95	5	1	1.1		44		99		97	
	90	2.4	1.5		86	13	1	1.3		50		98		50	
	89	1.8	4.4		90	10	0	1.2		18		73	83		
		(2.3)	(2.6)	MS/S				(1.2)	MR	(37)	S				S
7101	91	2.0	1.5		82	11	7	1.5		90		98		99	
	90	1.8	3.0		80	16	4	1.5		87		95		52	
	89	1.8	3.8		89	11	0	1.2		71		95	90		
	88	1.4	3.8		91	8	1	1.2		86		70	83		
		(1.8)	(3.0)	MS				(1.4)	MR	(84)	MR				S
IS 7111	91	1.3	1.0		93	6	1	1.2		71		99		91	
	90	1.8	2.0		88	11	1	1.3		81		93		65	
	89	1.6	4.2		95	5	0	1.1		62		73	85		
	88	1.5	3.8		100	0	0	1.0		41		87	85		
		(1.8)	(2.8)	MR				(1.2)	MR	(84)	MS				MS

Table B. (Cont.)

Hybrids	Rust[1]				Verticillium Wilt[2]					Downy Milden[3]		Sclerotinia Wilt[4]			
	Mean Index				%Healthy	%	%Severe	Mean	Class	%		%healthy			Class
	Year	Morden	W.Man.	Class	& Mild	Mod.	& Dead	Index		Res.	Class	MRS	Nep	Elias	
ISOLEIC	91	1.8	1.5		87	11	2	1.3		71		100		98	
	90	2.6	2.0		67	26	7	1.8		100		98		70	
	89	2.2	4.2		92	8	0	1.2		83		91	91		
	88	1.3	3.8		97	3	0	1.1		100		82	88		
		(2.0)	(2.9)	MS				(1.4)	MR	(89)	MR				MS
MRS 40	91	1.0	1.0		97	2	1	1.1		62		100		99	
	90	1.7	1.0		99	1	0	1.0		98		96		83	
	89	1.6	3.8		95	5	0	1.1		26		94	92		
	88	1.3	3.5		99	1	0	1.0		68		87	86		
		(1.4)	(2.3)	MR				(1.1)	R	(64)	MS				MR
S 1296	91	1.8	1.8		93	6	1	1.1		68		100		98	
	90	2.1	2.0		74	22	4	1.6		88		99		74	
	89	2.0	3.8		96	4	0	1.1		52		91	91		
	88	1.3	3.5		94	6	0	1.1		78		92	83		
		(1.8)	(2.8)	MS				(1.2)	MR	(72)	MS				MS
S1888	91	1.8	1.3		97	3	0	1.1	R	88	MR	100		97	
ST 310	91	1.5	1.3		96	3	1	1.1		90		100		98	
	90	1.7	2.5		88	12	0	1.2		88		94		76	
	89	2.2	4.4		99	1	0	1.0		85		92	96		
	88	1.5	4.5		99	0	1	1.1		100		81	88		
		(1.7)	(3.2)	MS				(1.1)	R	(91)	R				MS
ST 330	91	1.0	1.0		97	3	1	1.1		41		100		100	
	90	1.2	2.0		94	6	0	1.1		98		98		96	
	89	1.6	3.7		95	5	0	1.1		37		92	94		
		(1.3)	(2.2)	MR				(1.1)	R	(59)	MS				R
SIG 422	91	2.0	1.5		94	4	2	1.0		92T		100		93	
	90	2.6	2.5		79	11	10	1.6		98T		96		85	
	89	1.8	3.2		85	13	2	1.3		56		97	90		
		(2.1)	(2.4)	MS				(1.3)	MR	(82)	MR				MR
SIG 452	91	1.5	1.3		97	3	0	1.1		92T		100		97	
	90	1.5	2.0		92	8	0	1.2		94T		95		79	
	89	1.6	4.2		99	1	0	1.0		88		91	89		
		(1.5)	(2.5)	MR				(1.1)	R	(91)	R				MS
SIG 458	91	0.8	1.0		92	7	1	1.1		84T		100		98	
	90	1.0	1.0		99	1	0	1.0		98T		98		80	
	89	1.0	2.5		99	1	0	1.0		47		78	96		
		(0.9)	(1.5)	R				(1.0)	R	(76)	MS				S

Table B. (Cont.)

Hybrids	Year	Rust[1] Mean Index Morden	W.Man.	Class	Verticillium Wilt[2] %Healthy & Mild	% Mod.	%Severe & Dead	Mean Index	Class	Downy Mildew[3] % Res.	Class	Sclerotinia Wilt[4] %healthy MRS	Nap	Elias	Class
SIG 465A	91	1.0	1.5		96	3	1	1.1		96T		100		96	
	90	1.5	1.0		96	4	0	1.1		94T		98		78	
	89	1.8	4.2		93	7	0	1.1		84		97	92		
	88	1.3	3.5		100	0	0	1.0		97		91	78		
		(1.4)	(2.6)	MR				(1.1)	R	(93)	R				MS
SUNWHEAT 101	91	2.3	1.8		88	9	3	1.4		54		100		96	
	90	2.0	2.5		85	11	3	1.4		81		95		69	
	89	1.8	3.9		90	10	0	1.2		58		86	91		
	88	1.5	4.5		33	5	2	1.7		61		67	80		
		(1.9)	(3.2)	MS				(1.4)	MR	(64)	MS				MS
Sunwheat 103	91	2.8	2.0		87	13	0	1.2		30		100		91	
	90	2.8	2.5		93	6	1	1.2		60		93		62	
	89	2.8	3.8		96	4	0	1.1		30		81	85		
	88	2.1	4.5		79	21	0	1.5		8		76	57		
		(2.6)	(3.2)	MS/S				(1.3)	MR	(32)	S				S
TRISUN 849	91	1.3	1.3		87	8	5	1.3		64T?		100		94	
	90	2.1	2.0		87	10	3	1.3		85T		91		57	
	89	1.8	4.0		84	12	4	1.4		43		86	97		
		(1.7)	(2.4)	MS				(1.3)	MR	(64)	MS				S
DK 3800	91	1.3	1.0		96	4	0	1.1		100		100		97	
	90	2.3	2.5		93	7	0	1.1		98		97		66	
	89	2.2	4.2		94	6	0	1.1		94		92	91		
		(1.9)	(2.6)	MS				(1.1)	R	(97)	R				MS
DK 3840	91	0.8	1.3		97	1	1	1.1		98T?		100		99	
	90	1.7	2.0		92	7	1	1.2		100T		96		72	
	89	1.8	4.2		91	9	0	1.2		100		90	96		
		(1.4)	(2.5)	MR				(1.2)	MR	(99)	R				MS
DK 3861	91	1.0	1.0		99	1	1	1.1		100		100		92	
	90	2.0	1.5		96	4	0	1.1		98		89		55	
	89	1.6	4.0		95	5	0	1.1		91		88	89		
		(1.5)	(2.2)	MS				(1.1)	R	(96)	R				S
DK-EXP 399	91	2.3	1.8		99	0	0	1.0		92		100		94	
	90	2.8	2.8		85	14	1	1.3		100T		99		54	
	89	2.6	4.0		90	10	0	1.2		100		84	91		
		(2.6)	(2.9)	MS/S				(1.2)	MR	(97)	R				S
DK-EXP 3946	91	1.3	1.7		93	6	1	1.2		94		99		94	
	90	2.6	2.0		88	12	0	1.3		98T		95		49	
	89	1.4	4.2		78	22	0	1.4		95		85	83		
		(1.8)	(2.8)	MS				(1.3)	MR	(95)	R				S

Table B. (Cont.)

Hybrids	Year	Rust[1] Mean Index Morden	W.Man.	Class	Verticillium Wilt[2] %Healthy & Mild	% Severe Mod. & Dead		Mean Index	Class	Downy Mildew[3] % Res.	Class	Sclerotinia Wilt[4] %healthy MRS	Nap	Elias	Class
IS 6111	91	1.3	1.3		98	1	1	1.1		79T?		100		100	
	90	1.3	2.0		87	13	0	1.3		60		97		72	
	89	1.2	3.4		100	0	0	1.0		100		98	95		
		(1.3)	(2.2)	MR				(1.1)	R	(80)	MR				MS
SUNBRED 265	91	1.0	0.8	MR	99	1	0	1.0	R	40	S	100		92	
SUNBRED 268	91	1.8	1.8		72	22	4	1.6		44T		99		93	
	90	2.6	2.5		67	28	5	1.8		75T		98		49	
	89	1.2	4.4		98	2	0	1.0		100		89	97		
		(1.9)	(2.9)	MS				(1.5)	MS	(73)	MS				S
ST 880165	91	1.8	1.5		95	4	1	1.1		92		100		97	
	90	1.6	1.5		92	6	2	1.2		96		98		67	
	89	1.8	3.9		91	9	0	1.2		84		90	92		
		(1.7)	(2.3)	MS				(1.2)	MR	(91)	R				MS
2-YEAR ENTRY															
MRS 50	91	2.0	1.5		95	4	1	1.1		95		100		94	
	90	2.1	1.4		87	9	4	1.3		100		100		56	
		(2.1)	(1.5)	MS				(1.2)	MR	(98)	R				S
DK 3785	91	2.3	1.0		78	13	9	1.6		98T		100		97	
	90	2.3	1.9		80	15	5	1.5		88T		96		69	
		(2.3)	(1.5)	MS				(1.6)	MS	(93)	R				MS
PAC 7822	91	0.7	0.8		86	13	1	1.3		79		100		94	
	90	0.5	0.9		77	18	6	1.6		45		94		39	
		(0.6)	(0.9)	MR/R				(1.5)	MS	(62)	MS				MS
SM1547	91	1.5	1.3		76	15	9	1.7		58		100		97	
	90	2.0	1.5		87	10	3	1.3		83		96		71	
		(1.8)	(1.4)	MS/MR				(1.5)	MS	(71)	MS				MS
ST 439	91	2.3	2.0		93	5	2	1.2		71		100		97	
	90	2.9	3.0		88	11	1	1.3		74		96		68	
		(2.6)	(2.5)	MS/S				(1.3)	MR	(73)	MS				MS
EX 8812	91	0.8	1.0		99	1	0	1.0		82		100		99	
	90	1.6	1.3		97	1	2	1.1		94		100		76	
		(1.2)	(1.2)	MR				(1.1)	R	(88)	MR				MS
642SHO	91	2.0	1.5		73	15	13	1.8		100		100		97	
	90	2.4	1.8		68	24	8	1.8		100		99		58	
		(2.2)	(1.7)	MS				(1.8)	MS	(100)	R				S
Sigco 848	91	1.5	2.0		78	16	8	1.5		64T?		100		97	
	90	1.7	1.4		83	13	4	1.4		90T		97		49	
		(1.6)	(1.7)	MS				(1.5)	MS	77	MS				S

Table B. (Cont.)

Hybrids	Rust[1]				Verticillium Wilt[2]					Downy Mildew[3]		Sclerotinia Wilt[4]			
	Mean Index				%Healthy	%	%Severe	Mean	Class	%		%Healthy			Class
	Year	Morden	W.Man.	Class	& Mild	Mod.	& Dead	Index		Res.	Class	MRS	Nap	Elias	
Non-oil Checks															
RH 2141	91	.	2.3		.	.	.	.		.		.		.	
	90	3.7	4.0		81	16	3	1.5		98T		99		70	
	89	2.6	5.0		82	18	0	1.4		48		76	98		
		(3.2)	(3.8)	S				(1.5)	MS	(72)	MS				MS
D 131	91	2.5	2.0		93	5	2	1.2		-		100		97	
	90	2.6	2.5		79	17	4	1.5		58		94		59	
	89	1.2	5.0		79	15	6	1.6		44		70	95		
		(2.1)	(3.2)	MS/S				(1.4)	MR	(51)	MS				S
D 151	91	2.8	2.3		87	5	7	1.4		28T?		100		94	
	90	3.0	2.0		86	4	10	1.5		84		89		57	
	89	1.6	4.4		91	9	0	1.2		24		83	98		
		(2.5)	(2.9)	MS/S				(1.4)	MR	(45)	MS				S
SIG 954	91	3.5	3.0		77	13	10	1.6		53T		100		98	
	90	3.9	4.0		72	25	3	1.6		100T		93		47	
	89	3.0	5.0		92	8	0	1.2		33		88	98		
		(3.5)	(4.0)	S				(1.5)	MS	(62)	MS				HS
SIG 984	91	3.3	3.5		76	12	12	1.7		35T		100		97	
	90	4.0	4.5		68	22	10	1.8		100T		95		54	
	89	2.2	5.0		73	27	0	1.5		11		73	89		
		(3.2)	(4.3)	S				(1.6)	MS	(49)	MS				S
SIG 974	91	3.5	3.6		85	10	5	1.4		35T		100		93	
	90	3.2	3.0		84	9	7	1.5		98T		98		55	
	89	2.2	4.9		93	7	0	1.1		10		82	97		
		(3.0)	(3.8)	S				(1.3)	MR	(47)	MS				S
IS 8004	91	2.8	2.5	MS/S	25	32	43	3.3	S	10	HS	100		98	
4-Year Entry															
MRS 589	91	3.0	2.5		71	15	14	1.9		63		100		98	
	90	3.1	2.5		71	20	9	1.8		54		94		80	
	89	2.2	5.0		69	25	6	1.8		30		83	98		
	88	1.3			92	8	0	1.2		73		64			
		(2.4)	(3.3)	MS/S				(1.7)	MS	(55)	MS				MS

1-Field reaction to rust at Morden and in western Manitoba (races 3 & 4 predominant). Indices 1 to 5 based on % leaf area infected; 1=highly resistance (0-5%); 2=moderately resistance (5-10%); 3=moderately susceptibile (10-30%). 4= susceptible (30-50%) and 5=highly susceptibile (>50%) were assigned.

2- Field reaction to verticillium wilt in naturally infested soil. Indices of 1 (healthy & mild), 3 (moderate) and 5 (severe & dead) were assigned; the mean disease index was obtained by multiplying the number of plants in each class by the corresponding index, and the total divided by the total number of plants.

3- Reaction to downy mildew (race 2, Morden) under controlled conditions in growth rooms.

T Treated seed recieved for these hybrids showed high scores (escape) in downy mildew testing.

4- Field reaction to sclerotinia wilt in naturally infested fields at Napenn, Morden and Elias farm north of Morden.

* Values between parentheses are means of 2-,3-, or 4-year results.